SPECIAL ISSUE: TEENAGE DRIVERS

STATUS REPORT

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

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WHEN PARENTS ARE WATCHING

their teenage children drive differently than when they're alone or with friends. Unsupervised teens take more risks behind the wheel. A new Institute study indicates that equipping the cars teens drive with in-vehicle monitoring devices can help reduce these risks by giving feedback about driving behavior to both teenagers and their parents. Yet the devices may turn out to be tough sells not only to the beginning drivers but even to their parents, and over time the teens may become less cautious if they think their parents

aren't paying attention. A companion survey indicates that most parents think the technology helps their kids be safer drivers.

"Monitoring devices can help reduce teens' risky driving," says Anne McCartt, Institute senior vice president for research, "and perhaps ease some of the worry parents face when their kids start to drive. Our findings also suggest that technology can't substitute for parents getting involved."

Teenage drivers' crash risk is consistently higher than the risk in any other age group (see *Status Report*, June 27, 2007; on the web at iihs.org). One proven way to reduce this risk is through strong graduated licensing laws (see p.4). Another potential way is to use technologies to monitor driving and flag risky behavior like speeding, aggressive driving, and nonuse of belts. Some of these gadgets can pinpoint a vehicle's location and even let parents dial directly into the car if an alert sounds (see p.3). Several insurers offer such devices to policyholders with teen drivers (see p.7).

"When I'm with her my daughter drives differently than when she's with her friends," says Kathy Paxton, mom of a teenager who participated in the study that monitored 16- and 17-year-old drivers in the suburban Washington, DC, area during a 24-week period. "You really don't know how they're driving until you have a monitor in their car. It was an eye opener. I would love to have my other daughter who's going to be driving soon have it in her car."

Vehicles driven by the 84 teens in the study were outfitted with a black box that continuously monitored their driving. The unit had global positioning system capabilities plus a satellite modem to transmit data to a central processing center. The device recorded driving-specific data but no video or sound. It detected when drivers braked sharply or accelerated suddenly, didn't use belts, and exceeded speed limits. Data were posted on a secure website for parents to review.

Study groups: Participants were randomly assigned to 1 of 4 groups. Drivers in groups 1 and 2 heard audible alerts for risky maneuvers. A short, low-pitched buzz sounded for sudden braking and acceleration. A continuous low-pitched buzz sounded when the belt wasn't buckled and stopped only when it was fastened. Speeding triggered a single beep at 2.5 mph over the posted limit, followed by continuous beeps at increasing pitch and frequency when the teenage drivers exceeded the limit by more than 10 mph. The alerts were designed to be louder than the radio and the surrounding traffic.

For drivers in group 1, information about triggering events immediately was reported to the website for parents' inspection. Teenagers in group 2 could correct their driving within 20 seconds of an alarm to avoid having the violation reported to their parents. Researchers discovered late in the study that the conditional notification mode never had been activated, though the teen drivers and their parents in this group weren't aware of the glitch.

There were no in-vehicle alerts for drivers in group 3, just website notification. Group 4 was a control group with monitoring but no alert or web notification.

Although parents of newly licensed drivers in a previous Institute survey said they wanted to know more about their teens' unsupervised driving (see *Status Report*, June 15, 2007; on the web at iihs.org), researchers had trouble recruiting families for the monitoring project. Teens had to be the primary drivers of the monitored vehicles, and their parents had to have web access.

"At first it was tough finding families willing to participate until we added a $500 payment to compensate them for their time," McCartt says. "Part of the problem may be that the monitoring technology is relatively new, so parents and teens weren't familiar with it. Their reluctance also signals that more widespread use of these devices may turn out to be a tough sell."

Once the devices were in 31 vehicles, researchers noted that only a handful of parents visited the website. This prompted the Institute's study coordinator to decide to send short driving report cards every 2-3 weeks to the parents of the next teens who got devices. These reports were designed with the assumption that parents would go to the website for more details about their teenagers' risky driving. However, parents receiving the reports used the website even less frequently than those in the initial group.

Belt use reminders: Many teens don't use safety belts, despite the lifesaving benefits. About half of 16- and 17-year-old drivers killed in crashes in 2007 weren't belted. Monitoring devices can help, the researchers found.

At 94 percent, belt use among teens in the study already was high, and the few holdouts gave in and buckled up when the continuous buzz sounded. Belt use improved even among teens in the web-access-only group. Similar effects have been observed among drivers of all ages in studies of belt reminders that chime or buzz for extended intervals when drivers don't use belts (see *Status Report*, June 13, 2006; on the web at iihs.org).

Stops and starts: Sudden braking and abrupt acceleration can signal driver risk-taking or inattentiveness. In the *(continues on p.6)*

VARIETY OF GADGETS RIDES SHOTGUN WITH TEENAGERS

When it comes to selecting a monitoring device for their young drivers, parents have several to pick from, depending on how much they want to know — or in some cases, see — what their teenagers are doing on the road. These devices record data about specific actions such as quick starts and stops, abrupt lane changes and cornering, speed, and safety belt use. Some have global positioning system (GPS) capabilities so parents can pinpoint in real time where their teenagers are driving and even limit where they travel. Others provide feedback, letting drivers know through beeps, buzzes, lights, or verbal warnings if driving should be corrected.

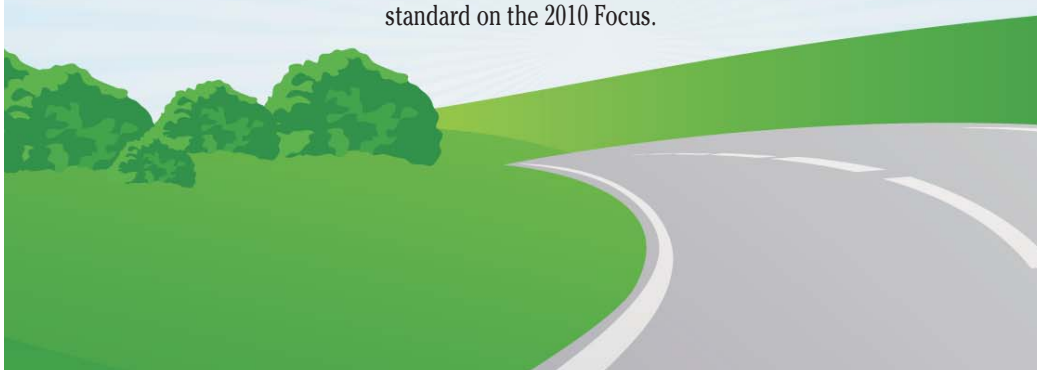
Basic systems: These use a vehicle's electronic onboard diagnostics recorder to store trip information for downloading later. For example, Davis Instruments' CarChip plugs into the diagnostics port that's in most 1996 and later vehicles, usually near the steering wheel, and retrieves speed, mileage, and other data from the vehicle control sensors. CarChip can be set to beep if a driver exceeds certain speed thresholds or takes other risks. Road Safety International markets a similar system.

GPS-based systems: These store data on vehicle location, speed, and direction. Some give teens feedback on their driving. Real-time systems automatically can call, email, or text alerts to parents about their teenagers' driving performance.

Inthinc's Tiwi has real-time GPS capabilities. Parents decide what events will trigger alerts and driving reports. They can monitor their teens' real-time habits and location via a website and receive instant phone, text, or email notifications. They can even phone their children directly through the system. When teenagers are at the wheel, they get feedback through audible alerts, either beeps or verbal warnings like "Unsafe acceleration. Ease off gas pedal." The system gives a driver a chance to correct a behavior before parents find out. The unit can compare a vehicle's speed against a proprietary database of posted speed limits.

Video systems: DriveCam is a camera system without GPS tracking. Mounted below the rearview mirror, the camera captures sound inside a vehicle and views of the interior and of the road ahead. DriveCam saves the images if a crash or other specific event occurs. Teenagers know they've triggered a recording if they see the device's green light blink red. Data, including 10 seconds of audio and video before and after an event, are transmitted to a center where analysts review the video and assign a score to the driver (the higher the score, the worse the infraction). Analysts also recommend tips for safer driving. Everything is uploaded to a website where parents and teens can view the video and suggestions. Driving reports that show teenagers how they stack up against peers are mailed to parents each week.

Smart keys: Starting with some 2010 models, Ford is rolling out MyKey, designed to help parents set limits on teenagers' driving. The computer-coded key allows parents to limit maximum speed to 80 mph. A sound chimes and stereo volume mutes if belts aren't buckled. Parents can specify alerts when teens reach 45, 55, or 65 mph. Parents also can specify limits on maximum stereo volume. This system will be standard on the 2010 Focus.



STRONG TEEN DRIVING LAWS REDUCE CRASHES, INSURANCE CLAIMS

Graduated licensing laws the Institute rates good are associated with lower fatal crash rates among teen drivers and lower insurance losses, compared with laws rated poor. Strong restrictions on nighttime driving and teen passengers, as well as delayed licensing age, also reduce fatal crashes and insurance losses. These are the main findings of a pair of studies by the Institute and affiliated Highway Loss Data Institute.

"First we looked at teens' fatal crash rates based on the overall strength of the graduated systems in each state," explains Anne McCartt, Institute senior vice president for research. "Then we looked at the specific elements of each system to tease out their effects. Doing the same for insurance claims data gave us more insight into all kinds of crashes, not just the most severe ones. We found that strong laws affect everything from minor fender benders to fatal impacts."

Teens are overinvolved in crashes. The fatal crash rate per mile among 16-19 year-olds is 4 times as high as for older drivers. To address this toll (4,342 deaths of people of all ages in crashes involving teen drivers in 2007), states have adopted graduated systems that phase in driving by young beginners as they mature and develop skills. States with these systems reduce crashes 10-30 percent.

Since 2000, the Institute has rated states' young driver licensing laws. Key components include a learner's stage beginning no earlier than age 16, lasting at least 6 months, and requiring a minimum of 30 practice hours, as well as an intermediate stage that permits no more than 1 teen passenger and prohibits driving after 9 or 10 pm. These restrictions should last a year or preferably until age 18.

Based on the Institute's current rating system, no states in 1996 had laws rated good, but there has been progress. Now the laws in 31 states and the District of Columbia are rated good, 12 are fair, 7 are marginal, and no states are poor (go to iihs.org/laws).

Using data on 1996-2007 fatal crashes, researchers looked at how the laws affect teen drivers' per-population fatal crash rates. The upshot is that the Institute's rating system lines up well with reductions in the rates among 15-17 year-olds. The better the overall rating, the bigger the fatal crash rate reduction. Graduated systems rated good had 30 percent lower rates than systems rated poor. Fatal crash rates were 11 percent lower where the laws are rated fair.

The Highway Loss Data Institute's analysis examined claims data for rated 16-17-year-old drivers per insured vehicle year (an insured year is 1 vehicle insured for 1 year or 2 insured for 6 months each, etc.). For insurance purposes, a rated driver typically is considered to represent the greatest loss potential for an insured vehicle.

For laws rated good, researchers determined that the frequency of claims under collision coverage was 16 percent lower among drivers 16 and 17. Losses were 13 percent lower in states with laws rated fair and 10 percent lower where the laws are marginal. Relatively minor crashes dominate collision claims. About half are for damages less than $2,000. Losses in this study were examined for vehicles 3 years old or newer in 1996-2006.

Both studies confirm that the licensing age is an important factor. The older this age, the fewer fatal crashes there are per population. A 6-month delay, from 16 to 16½ for example, lowered 15-17 year-olds' fatal crash rate by 7 percent. A 1-year delay lowered it by 13 percent. Likewise, delaying the licensing age by 1 year reduced the collision claim frequency by 12 percent among 16 year-olds.

"An older licensing age means fewer teen drivers and lower exposure, so it's not surprising that delaying this age makes a difference in crashes per population," McCartt explains. "The effect for insurance losses, though, applies only to licensed drivers, so an older licensing age means that when teens do get their licenses they're safer drivers."

Most US states license at 16, 16½, or somewhere in between, and a few license younger than 16. Only New Jersey waits until 17, which lowers fatal and injury crash rates per population (see *Status Report*, Sept. 9, 2008; on the web at iihs.org).

Passenger and nighttime restrictions significantly reduce fatal crash rates and insurance losses. For example, the fatal crash rate of 15-17 year-olds was 21 percent lower when the beginners were prohibited from having any teenage passengers in their cars versus allowing 2 or more. Allowing only 1 passenger reduced the rate by 7 percent. Driving restrictions beginning at 9 pm cut fatal crashes an estimated 18 percent versus no restrictions. The reduction was 12 percent where 15-17 year-olds' driving was limited after midnight.

For insurance losses among 16-17-year-old drivers, restricting the number of passengers to no more than 1 resulted in a 6 percent decrease. Imposing a 9 pm nighttime driving restriction resulted in an 11 percent reduction in collision claim frequencies.

Graduated licensing usually includes a minimum period for a learner's permit. Increasing how long a learner has to stay in this stage delays the age for an intermediate license and gives teens more supervised practice opportunities. The results show the benefits of delayed licensure, but neither study found an additional benefit for permit holding.

Another aspect of graduated licensing involves the amount of practice behind the wheel that learners are required to get, and findings are mixed. A 20-hour increase in required practice reduced the risk of collision claims by 4 percent among teens once they got licenses. However, practice didn't affect the rate of fatal crashes per population.

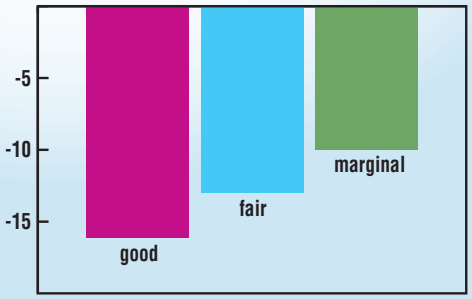
"These studies show that graduated systems protect teens not only by delaying licensure but also by producing drivers who are less likely to crash," McCartt says. "States have made tremendous progress over the past 12 years, but it's clear that all graduated programs don't provide equal benefits. Many states still need to set strict limits for teens on night driving and teen passengers. It's also time for serious conversations about raising the licensing age for teens."

For a copy of "Graduated licensing laws and fatal crashes of teenage drivers: a national study" by A.T. McCartt et al., and " Effect of graduated licensing on collision claim frequencies of young drivers" by R.E. Trempel, write: Insurance Institute for Highway Safety, 1005 North Glebe Road, Arlington, VA, 22201; or email publications@iihs.org.

PERCENT CHANGE IN FATAL CRASHES OF 15-17 YEAR-OLDS, PER 100,000 PEOPLE, BY GRADUATED LICENSING PROVISION

DELAY PERMIT AGE	
1 year	-13
6 months	-7
DELAY LICENSING AGE	
1 year	-13
6 months	-7
RESTRICT TEEN PASSENGERS	
none allowed	-21
1 allowed	-7
RESTRICT NIGHT DRIVING	
9 pm	-18
midnight	-12

PERCENT CHANGE IN COLLISION CLAIM FREQUENCIES, 16-17 YEAR-OLDS, BY GRADUATED LICENSING LAW RATING



(*continued from p.3*) study, rates of sudden stops and starts fell among teenagers in the monitoring groups relative to the control group, especially in vehicles with audible alerts, but the differences were statistically significant only for teens in group 1 with immediate website notification. Alerts were short and not particularly annoying. The effects were greater among teens whose parents received periodic report cards.

Driving faster than the posted speed limit was the most prevalent risky behavior. At first, speeding more than 10 mph above the limit sharply declined among teens in the 2 groups with alerts in their vehicles, but then the rates of speeding began to rise over time. Instances of speeding more than 10 mph over the posted limit were reduced significantly only when alarms sounded in the vehicles, speed-related report cards were emailed to parents, and the teenage drivers had a chance to cancel the report cards by slowing down.

Most of the teen drivers increasingly broke speed limits over time, even though violations of more than 10 mph were posted to the web for parents to see. This may be because drivers grew more at ease behind the wheel and on the roads they traveled, McCartt says. It also could be because during the study many teenagers completed the probationary period for graduated licensing, so restrictions on young passengers were lifted. Teen drivers are more likely to take risks when they're out with other teens.

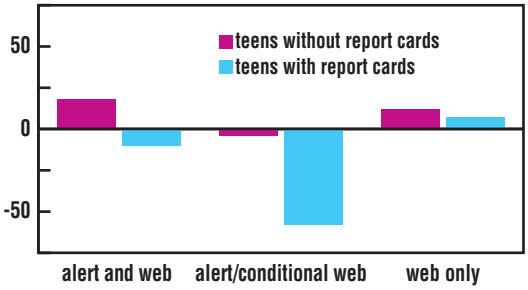
Risky behavior consistently declined among teens in the second monitoring group with driving report cards. Once these teens heard in-vehicle alerts, they believed they could correct their behavior before the system tipped off their parents. Teens in the first in-vehicle alarm group had less incentive to change their behavior. By the time they heard an alarm it was too late to prevent parental notification and improve their driving report card.

What parents and teenagers think: When monitoring ended, the researchers interviewed parents and teen drivers separately about their experiences. Ninety-eight percent of the parents said they'd recommend the monitoring device to other parents. When asked what they most wanted to know about their teenager's driving, parents most often said speeding (81 percent).

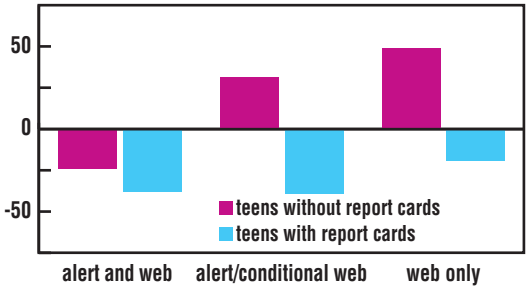
"I'd recommend it, especially for new drivers, for the oversight as well as the ability it gives parents to have conversations with [their children] about what might have been going on in the car" to trigger a web alert, says David Heyman, a Maryland father whose son participated in the study.

Teens felt the device made them better drivers. Eighty-three percent in the 2 in-vehicle alert groups and 81 percent in the web-access-only group thought the device was effective. More than half in each alert group described the beeps and buzzes as annoying, and the majority were happy when the unit was removed.

PERCENT CHANGE IN RISK OF SPEEDING BY MORE THAN 10 MPH



PERCENT CHANGE IN RISK OF SUDDEN BRAKING/ACCELERATION



INSURERS TAKE HIGH-TECH APPROACH TO TEEN DRIVERS

Recognizing that teen drivers are a special group, many auto insurers have programs that feature contracts between beginners and their parents, educational videos, online surveys, and practice driving logs to encourage safe habits. A few insurers provide free or discounted monitoring devices to policyholders with teen drivers. Interested parents should check what's available, including these 5 programs:

Safeco Insurance, a unit of Liberty Mutual, uses a GPS monitoring device called safety beacon in the Teensurance program it launched in 2007. The system and online programs allow parents to monitor teens' driving habits and locations in real time. You don't have to be a Safeco customer to enroll, but policyholders get premium discounts.

21st Century uses the MobileTEEN real-time tracking system to help parents keep tabs on their teen drivers. Parents get email or text alerts if their child's car exceeds predefined speed limits or is driven beyond certain boundaries or past curfew. The GPS device is free to 21st Century customers.

American Family Insurance offers DriveCam to policyholders through the Teen Safe Driver Program. DriveCam is a camera system without GPS tracking. Parents and teens can go online to review audio and video footage of risky driving actions that triggered the camera. Weekly report cards help teens see how their driving rates against their peers. Use is free to policyholders for the first year.

Progressive's MyRate program is marketed for all drivers, not just teens. A black box records things like speed, braking, time of day, and miles driven and then wirelessly transmits the information to a processing center. A website allows drivers to review trip data. The system doesn't have GPS, so it can't keep tabs on where a vehicle is driven. Safe drivers get discounts.

GMAC's Low Mileage Discount Program with OnStar gives drivers of General Motors vehicles incentives to limit their car trips. OnStar just records odometer readings, not speed or other driving data. It doesn't continuously track a vehicle's whereabouts. That only happens if there's a crash or the vehicle is stolen. The program is for drivers of all ages.

"It actually overall helped me to control my aggressive driving," says Tyler Kellogg, an Arlington, Virginia, teenager. "It gave me an indication of what I was doing wrong. I slowed down when I heard" an alarm. Still, he says he found the unit "annoying after a while."

The most effective monitoring system, parents said, would combine in-vehicle alerts with immediate parental notification. Teenagers preferred conditional notification. Many parents found the emailed driver report cards more useful and convenient than the website. Forty-three percent of parents reported having difficulties with the site, maybe because it wasn't as user-friendly as it could have been and pages sometimes took too long to load. Or, as McCartt points out, busy parents had other priorities. Maybe they also trusted researchers to let them know about any serious infractions.

As for privacy, some parents say it's not a real concern. "I don't think privacy is quite the issue it once was," Heyman says. "Teenagers are used to there being a little bit of monitoring and oversight" of things like cellphone use and texting.

Mom and Dad still hold the keys: Parents are big influencers of their kids' behavior. The more involved they are, the less likely kids are to engage in all types of risky activities associated with the teen years. Even the most sophisticated technology isn't going to have much of an effect if parents and teenagers don't talk about their driving.

"Aside from belt use, alarms alone aren't enough to change the risky way some teens drive," McCartt says. "It's tough to convince them not to speed, brake hard, and accelerate too quickly. Some teens in our study never got this message, but the group who believed they could correct their behavior before their parents found out did curb risk-taking as long as the devices were in their cars. It's obvious that parents need to act as driving coaches as well as rule enforcers. Kids know when Mom and Dad aren't looking. If their actions have no consequences, they have little incentive to play it safe, even when a black box records them."

For a copy of "In-vehicle monitoring and the driving behavior of teenagers" by C.M. Farmer et al., write: Insurance Institute for Highway Safety, 1005 North Glebe Road, Arlington, VA 22201, or email publications@iihs.org.

INTERACTIVE MAPS HIGHLIGHT LAWS ON TEEN DRIVING AND OTHER TRAFFIC SAFETY ISSUES

The Institute has added to iihs.org 2 interactive maps of the United States with state-by-state information on nighttime driving and passenger restrictions for beginning teenage drivers. Click on a state and learn more about the provisions. Other new maps include ones on automated traffic law enforcement, cellphone use while driving, child restraint use, motorcycle and bicycle helmet use, and safety belt use. Find these and other maps at iihs.org/laws.

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1005 N. Glebe Rd., Arlington, VA 22201
Phone 703/247-1500 Fax 247-1588
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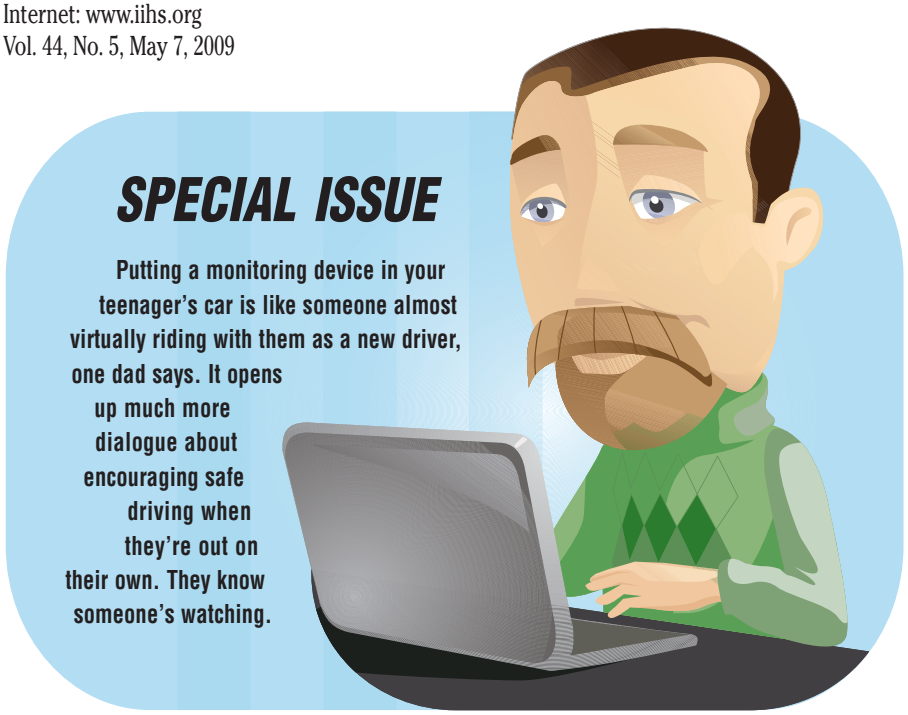

The Insurance Institute for Highway Safety is a nonprofit scientific and educational organization dedicated to reducing deaths, injuries, and property damage from crashes on the nation's highways. The Institute is wholly supported by auto insurers:

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Alfa Insurance
Allstate Insurance Group
American Family Mutual Insurance
American National Property and Casualty Company
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Amerisure Insurance
Amica Mutual Insurance Company
Auto Club Group
Auto Club South Insurance Company
Bituminous Insurance Companies
Bristol West Insurance Group
Brotherhood Mutual Insurance Company
California Casualty
Capital Insurance Group
Chubb Group of Insurance Companies
Concord Group Insurance Companies
Cotton States Insurance
COUNTRY Financial
Countrywide Insurance Group
Erie Insurance Group
Esurance
Farm Bureau Financial Services
Farm Bureau Mutual Insurance Company of Idaho
Farmers Insurance Group of Companies
Farmers Mutual of Nebraska
Fireman's Fund Insurance Company
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ICW Group
Indiana Farm Bureau Insurance
Kemper, A Unitrin Business
Kentucky Farm Bureau Insurance
Liberty Mutual
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MMG Insurance
Mutual of Enumclaw Insurance Company
Nationwide
Nodak Mutual Insurance Company
Norfolk & Dedham Group
North Carolina Farm Bureau Mutual Insurance Company
Ohio Casualty Group
Oklahoma Farm Bureau Mutual Insurance Company
Old American County Mutual Fire Insurance
OneBeacon Insurance
Oregon Mutual Insurance
Palisades Insurance
Pekin Insurance
PEMCO Insurance
The Progressive Corporation
Response Insurance
Rockingham Group
Safeco Insurance
Samsung Fire & Marine Insurance Company
SECURA Insurance
Sentry Insurance
Shelter Insurance
Sompo Japan Insurance Company of America
South Carolina Farm Bureau Mutual Insurance Company
State Auto Insurance Companies
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Tennessee Farmers Mutual Insurance Company
Tokio Marine Nichido
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